(D) Amendment to the Claims

1. (amended) A method of processing a group of spatially related seismic data traces, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a transform to said successively selected windows having poles on the unit z-circle, where z is the z-transform;

determining the frequency having the greatest amplitude within the frequency spectrum of the seismic data within said successively selected windows; and

utilizing said determined frequencies having the greatest amplitude to generate a thin bed seismic display in which horizontal dimension represents distance and vertical dimension represents time ~~utilizing said frequency spectra to generate data related to the location of thin beds in the earth's subsurface~~.

2. (amended) The method of claim 1 ~~further comprising determining~~ wherein the seismic display represents the frequency ~~value of the frequency component~~ having the greatest amplitude within each said frequency spectrum~~; and~~

~~wherein said frequency values are utilized to generate data related to the location of thin beds in the earth's subsurface~~.

3. (original) The method of claim 2 wherein said data comprises a three-dimensional volume of seismic data.

4. (original) The method of claim 3 further comprising generating a substantially horizontal cross-section of said seismic data to depict the location of thin beds.

5. (original) The method of claim 1 further comprising determining the ~~greatest~~ amplitude of the frequency having the greatest amplitude ~~components~~ within ~~each~~ said frequency spectrum; and

wherein the seismic display represents said amplitudes ~~are utilized to generate data related to the location of thin beds in the earth's subsurface~~.

6. (original) The method of claim 5 wherein said data comprises a three-dimensional volume of seismic data.

7. (original) The method of claim 5 further comprising generating a substantially horizontal cross-section of said seismic data to depict the location of thin beds.

8. (amended) The method of claim 1 further comprising:

determining for each generated frequency spectrum whether the peakedness of said generated frequency spectrum exceeds a selected value of peakedness; and

for each generated frequency spectrum for which the peakedness exceeds said selected value of peakedness, utilizing the frequency ~~spectrum to generate data related to the location of thin beds in the earth's subsurface~~. having the greatest amplitude to calculate bed thickness; and

wherein the seismic display represents bed thickness.

9. (original) The method of claim 8 wherein said peakedness is kurtosis.

10. (amended) The method of claim 1 further comprising:

~~determining the frequency component having the greatest amplitude within each said frequency spectrum:~~

calculating the kurtosis of each said frequency spectrum;

determining if the kurtosis of each said frequency spectrum exceeds a selected value of kurtosis; and

utilizing said frequency ~~components~~ having the greatest amplitude within each said frequency spectra having a kurtosis value which exceeds said selected value of kurtosis to

calculate bed thickness; and ~~generate data related to the location of thin beds in the earth's subsurface~~

wherein the seismic display represents bed thickness.

11. (original) The method of claim 10 wherein said data comprises a three-dimensional volume of seismic data.

12. (original) The method of claim 11 further comprising generating a substantially vertical cross-section of said seismic data to depict the location of thin beds.

13. (original) The method of claim 1 wherein said transform is the maximum entropy transform.

14. (original) The method of claim 13 wherein said transform has from one to four poles on the unit z-circle.

15. (original) A method of processing a group of spatially related seismic data traces, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a maximum entropy transform to said successively selected windows;

determining the frequency value of the frequency component having the greatest amplitude within each said frequency spectrum; and

utilizing said determined frequency values to generate ~~data related to the location of thin beds in the earth's subsurface~~ a thin bed seismic display in which the horizontal dimension represents distance and vertical dimension represents time

16. (original) The method of claim 15 wherein said data comprises a substantially horizontal cross-section of a three-dimensional volume of seismic data.

17. (original) The method of claim 15 wherein said method is implemented on a digital computer and comprises the following steps:

inputting default operational parameter values;

inputting operational parameters for said group of spatially related seismic data traces;

obtaining data set parameters from a first trace of said group of spatially related seismic data traces;

obtaining a first selected window of data from a first selected seismic trace;

calculating coefficients for the maximum entropy transform;

utilizing said coefficients to calculate said frequency spectrum; and

determining the frequency value of the frequency component having the greatest amplitude within each said frequency spectrum.

18. (amended) A method of processing a group of spatially related seismic data traces, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a maximum entropy transform to said successively selected windows;

determining the greatest amplitude of the frequency components within each said frequency spectrum; and

utilizing said amplitudes to generate ~~data related to the location of thin beds in the earth's subsurface~~ a thin bed seismic display in which the horizontal dimension represents distance and the vertical dimension represents time.

19. (original) The method of claim 18 wherein said data comprises a substantially horizontal cross-section of a three-dimensional volume of seismic data.

20. (original) The method of claim 18 wherein said method is implemented on a digital computer and comprises the following steps:

inputting default operational parameter values;

inputting operational parameters for said group of spatially related seismic data traces;

obtaining data set parameters from a first trace of said group of spatially related seismic data traces;

obtaining a first selected window of data from a first selected seismic trace;

calculating coefficients for the maximum entropy transform;

utilizing said coefficients to calculate said frequency spectrum; and

determining the greatest amplitude of the frequency components within each said frequency spectrum.

21. (amended) A method of processing a group of spatially related seismic data traces, comprising:

defining seismic data windows extending over selected portions of said group of spatially related seismic data traces;

generating a frequency spectrum of the seismic data within successively selected windows of said seismic data traces by applying a maximum entropy transform to said successively selected windows;

determining the frequency component having the greatest amplitude within each said frequency spectrum;

calculating the kurtosis of each said frequency spectrum;

determining if the kurtosis of each said frequency spectrum exceeds a selected value of kurtosis; and

utilizing said frequency components having the greatest amplitude within said frequency spectra having a kurtosis value which exceeds said selected value of kurtosis to calculate bed

thickness; and utilizing the calculated bed thickness to generate ~~data related to the location of thin beds in the earth's subsurface~~ a thin bed display in which the horizontal dimension represents distance and the vertical dimension represents time.

22. (original) The method of claim 21 wherein said data related to the location of thin beds comprises a substantially vertical cross-section of a three-dimensional volume of seismic data.

23. (original) The method of claim 21 wherein said method is implemented on a digital computer and comprises the following steps:

inputting default operational parameter values;

inputting operational parameters for said group of spatially related seismic data traces;

obtaining data set parameters from a first trace of said group of spatially related seismic data traces;

obtaining a first selected window of data from a first selected seismic trace;

calculating coefficients for the maximum entropy transform;

utilizing said coefficients to calculate said frequency spectrum;

calculating the kurtosis of said spectrum; and

determining whether said calculated kurtosis exceeds a preselected kurtosis value.

24. (original) A device adapted for use by a digital computer wherein a plurality of computer instructions readable by said digital computer and defining the process of claim 1 and instructing said computer to perform said process are encoded.

25. (original) The device of claim 24, wherein said device is selected from the group consisting of a magnetic tape, a magnetic disk, and an optical disk.